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**THE SUMMER MOLTING PLUMAGE OF CERTAIN DUCKS.**

BY WITMER STONE.

Of all our ducks I believe there is but one, the Old Squaw, in which the adult male has a distinct nuptial and winter plumage.

That is to say the old males of all our other ducks remain in the same plumage from the time they arrive in the autumn until their departure northward in spring.

Judging by what occurs in other birds we should say since these ducks show no tendency toward a change of plumage when they leave us in spring, that they must retain the same feathers that covered them during the winter, until the end of the breeding season, when a complete molt occurs and a new dress exactly like the one just shed, is assumed. In other words the plumage remains the same at all seasons, except for such changes as are effected by wear, tear and bleaching, and there is one annual molt at the close of the breeding season.

That this is not the case, however, has long been known, and a peculiar summer plumage of the adult males of several of our ducks has been described.

This has been variously termed "summer plumage," "molting plumage," "plumage after the breeding season," etc., but its true character seems not to be generally understood.

The first record of this peculiar summer plumage of male ducks, with which I am acquainted, occurs in the supplement to Montagu's *Ornithological Dictionary*, 1813, under head of the Pintail (*Dafila acuta*).

He here describes the molting of some domesticated individuals and states: "In the month of June or beginning of July these birds commenced their change of plumage, and by degrees after making a singular, mottled appearance, especially on the part of the body which was white before, became by the first week in August, entirely of a brown color. The beautiful bronze on the head, the white streak on each side of the neck, and all the white

beneath, as well as the elegant scapulars had entirely vanished, and to all appearance a sexual metamorphosis had taken place. But this change was of short duration, for about the latter end of September one of the males began to reassume the masculine attire . . . and by the middle of October this bird was again in full plumage."

In 1838, Waterton<sup>1</sup> described a similar molt in the male Mallard, and later on many other species were found to have the same habit of molting, so that in Ridgway's *Manual* we find the following species given, largely on the authority of Dresser, as having a peculiar summer plumage resembling the female:—Mallard, Blue-Wing and Cinnamon Teal, Gadwall, Widgeon, Pintail and Scaup. Additional species are mentioned in the British Museum catalogue.

Notwithstanding this, however, only a few of the above are mentioned in Elliot's *Wild Fowl* as having a peculiar summer plumage, and other works have ignored the question entirely.

A study of the magnificent collection of arctic birds made by Mr. E. A. McIlhenny, at Point Barrow, has shown conclusively that the various Eider ducks, the Pacific, Spectacled, King, and Steller's Eiders all assume a peculiar summer plumage, and further investigation adds the Red-breasted Merganser to the number.

With all these facts before us it seems not unreasonable to predict that in all ducks where the plumages of the male and female are markedly different we may expect to find this double molt and dull summer plumage in the male. So unexpected are some of the laws governing molts, however, that there may be exceptions.

As regards the reason for this double molt, Montagu was unable to furnish any explanation. He says: "The double molting in so short a time, peculiar to some species of birds, is a most curious and extraordinary circumstance that seems to bid defiance to all human reasoning. That some birds change their plumage with the season is evidently a gift of nature to accommodate their color to their habits, as in the Ptarmigan, which changes his mottled plumage in the autumn for that of white, in order that he may rest secure upon the bosom of the snow during winter. But there is no such evident reason for a double change in the short space of two or three months in the same season."

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<sup>1</sup> *Essays.*

An examination of Mr. McIlhenny's series of Eiders sheds a great deal of light upon this subject.

In the first place this summer plumage is in no sense a nuptial plumage; while it may begin to appear before the young birds are hatched it does not appear until the mating season is over and is distinctly a post-nuptial dress. It is mainly restricted to the head, neck, breast and scapulars, as already pointed out by Montagu; that is, to those parts which are most conspicuously colored.

The most important point in connection with this summer plumage is that the annual molt of the flight feathers does not begin until this dull plumage has been fully acquired, and as soon as the new flight feathers have become functional the dull plumage as well as the rest of the old plumage is lost and the annual molt of the body feathers progresses normally.

It will thus be seen that this dull plumage lasts only during the period when the bird is unable to fly, for, as is generally known, ducks molt their flight feathers all at once and temporarily lose the power of flight.

At such a time a dull blended plumage would naturally be important in rendering the bird inconspicuous and thereby protecting it, and such I think is the explanation of this curious summer molt.

Of the various names that have been suggested for it, "summer molting plumage" seems the best, as it is different in character from any plumage known among other birds, and, as has been already shown, has nothing to do with the nuptial season, but is entirely related to the annual molt.

I may further state that the feathers of this plumage are very poor and loosely constructed, like those of the "post-nidal" or "first" plumage of young birds, which is also a mere temporary summer dress.

In connection with the summer molting plumage of the Eiders it is interesting to note that Dresser, in his *Birds of Europe*, gives an excellent description of this plumage in the King Eider, but regards it as the "young male." In the same article he quotes from Mr. G. Gillett,<sup>2</sup> who saw several of these birds in Matthew's Strait, August 6, "all apparently immature males," though two specimens that were shot were found to be "entirely destitute of

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<sup>2</sup>*Ibis.*, 1880, p. 309.

quill feathers, so that they could not fly." Mr. L. Lloyd in *Game Birds and Wild Fowl of Norway* states also "that the old male of the common Eider loses his brilliant dress toward autumn and becomes in a great part black," but neither he nor Mr. Dresser seem to have understood the significance of these changes.

I can hardly realize that the question has not been satisfactorily explained heretofore, but a somewhat extended research has so far failed to discover such explanation and I have therefore prepared an outline of this peculiar molt.

Descriptions of the molting plumages of the several Eider ducks found in Alaska are appended, taken from specimens in the collection of Mr. McIlhenny, to whom I am under obligation for allowing me to make use of this material, and to whose energy and perseverance science is indebted for one of the finest collections of Arctic birds yet obtained.

**Somateria spectabilis** (Linn). King Eider.

Breeding males up to June 1. are in full nuptial plumage. The next specimens obtained were on August 24 and 30, and these illustrate the change to the molting plumage. The breast is speckled all over with new brown, white and black barred or mottled feathers, the interscapulum is largely speckled with black and the head and neck are being covered with dull brown feathers with black tips. The pattern of the green and pale bluish areas on the head as well as the black V on the throat are still clearly apparent, though they are being rapidly replaced by dull brown feathers and the bright plumage that remains is but lightly attached and easily dislodged.

Another specimen taken August 24, but further advanced, has lost all trace of the bright plumage and is dull colored all over the head, neck and breast. In none of these are the flight feathers molted though they are exceedingly worn and bleached.

**Somateria v-nigra** (Gray). Pacific Eider.

The series of this species includes males in nuptial plumage up to June 3, after which none were secured until August 20. This specimen is a little more advanced than the first King Eiders described above; the dull molting plumage is nearly complete but traces of the bright feathering of the head remain; the old worn flight feathers have not been shed. The next specimens taken

September 17 (1) and September 23 (5) are in full molting plumage : belly and wings as in nuptial dress, head and neck dull brown, streaked with black, and with indistinct lighter areas on the head; breast mottled, feathers generally white in the centre, black at the tip and barred with brown; some are all brown and some all white, scapulars blackish or brownish varied with white. In all six specimens the flight feathers have been molted and the new ones are about half grown. The last specimen of this interesting series was taken October 6; it shows a full grown set of new flight feathers while the new winter plumage is supplanting the temporary molting plumage and the remains of the nuptial dress.

The breast plumage is almost completely renewed but is still flecked with brownish feathers, while the new green feathers of the head may be seen just bursting from the pin-feather sheaths, though still concealed by the brown feathers of the molting plumage.

***Arctonetta fischeri*** (Brandt). Spectacled Eider.

Males in nuptial plumage were obtained as late as July 27, while one specimen, taken September 17, represents the molting plumage. No similar bird has, I believe, ever been described.

The new flight feathers are nearly full grown; the head and neck are gray, streaked with black, front and cheeks whitish, eye area gray, centre of throat white, more or less brown, barred feathers on the breast, back and scapulars largely gray.

***Eniconetta stelleri*** (Pall). Steller's Duck.

Adult males in nuptial plumage were secured by Mr. McIlhenny up to July 2, but none after that date. Fortunately a specimen secured by Dr. Benj. Sharp, at St. Lawrence Island, July 24, 1895, No. 34,520, Coll. Acad. Nat. Sci., supplies the desired plumage for this species. It is as follows :

Belly, back and wings as in the nuptial plumage, entire head and neck dull brown, with a few of the green and white feathers still unshed, plumage of breast very ragged in appearance with new brownish feathers everywhere replacing those of the nuptial dress.

As would be supposed from the condition of the plumage the flight feathers have not yet been shed.

***Merganser serrator*** (L). Red-breasted Merganser.

Two males secured July 27 at Pt. Barrow are acquiring the molting plumage, the first instance I have seen of the existence of this plumage among the Mergansers.

They resemble the nuptial plumage, except the head, neck and breast, exactly as in the Eiders. The neck is like that of the female, but browner, head and crest dull brown, the breast is becoming dull gray. Many of the black feathers of the head and pink and black feathers of the breast still remain from the nuptial plumage, but they are very easily brushed loose. The flight feathers have not yet been molted.